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DRAFT

INTEGRAL PILE JACKETS.
(REV 6-20-08) (FA 6-26-08) (1-09)

PAGE 563. The following new Section is added after Section 455:

SECTION 457
INTEGRAL PILE JACKETS

457-1 Description.

Furnish, fabricate and install an integral pile jacket in accordance with the Contract Documents.

457-2 Materials.

457-2.1 Stay-In-Place Forms: Use forms composed of a durable, inert, corrosion resistant material with an interlocking joint along one or two sides that permits the form to be assembled and sealed in place around the pile. Fabricate the forms from fiberglass and polyester resins, having a minimum thickness of 1/8 inch. Ensure the form is capable of maintaining its original shape without additional support or damage when placed around a pile. Ensure the inside face of the form has no bond inhibiting agents in contact with the filler material. Provide the forms with bonded or bolted-on, non-corrosive standoffs to maintain the forms in the required positions. Sandblast or score the inside surface of the forms with an abrasive material to provide a rough surface texture. Equip the forms with a compressible sealing strip at the bottom which will effectively seal the annular space between the pile and the form. Use non-metallic hardware for pumping ports when these are provided. Fabricate the pile jacket form in a workmanlike manner and have it inspected and approved by the Engineer prior to placement on piles. Remove any pile jacket form not approved from the project.

The forms shall meet the following physical property requirements of Table 1:

Table 1: Physical Requirements of Stay-In-Place Forms	
Water Absorption (ASTM D 570)	1% maximum
Ultimate Tensile Strength (ASTM D 638)*	9,000 psi minimum
Flexural Strength (ASTM D 790)*	16,000 psi minimum
Modulus of Elasticity (ASTM D 790)	700,000 psi minimum
IZOD Impact (ASTM D 256)	15 lb/inch minimum (unnotched specimen)
Barcol Hardness (ASTM D 2583)	45 minimum
Color: Similar to Federal Color Standard No. 595, Table VIII, Shade No. 36622. The color must be integral in the form material.	
* On original specimens whose flat surfaces are not machined to disturb the fiberglass.	

457-2.2 Anode Material: For cathodic protection, use expanded mesh anodes pre-installed inside the form by the manufacturer. Use anode type and configuration shown in the

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Contract Documents. If galvanic anodes are used, place the nodes in direct contact with the inside face of the form.

457-2.3 Fillers: Use Portland cement grout fillers for non-structural jackets and concrete fillers for structural jackets.

457-2.3.1 Portland Cement Grout: Use a mix design of Portland cement, fine aggregate, water and an admixture containing a minimum of 940 pounds of cementitious material per cubic yard. Up to 30%, by weight of cement, may be replaced by fly ash for standard pile jackets. Do not use fly ash, slag, or silica fume for cathodic protection jackets.

Use Silica Sand fine aggregate meeting the requirements of Section 902.

Use Portland cement meeting the requirements of Section 921.

Use admixtures meeting the requirements of Section 924, AASHTO M 194, Types A and D.

Use air-entraining admixtures meeting the requirements of Section 924 and containing no chlorides or other salts corrosive to metals.

Use fly ash meeting the requirements of Section 929, ASTM C 618, Type F, except that loss on ignition shall not exceed 4%.

Provide a grout filler mix with a minimum compressive strength of 5,000 psi at 28 days and a slump of 7 to 9 inches. Submit the design mix to the Engineer for approval before placing any grout filler.

457-2.3.2 Class IV Concrete: Use Class IV Concrete meeting the requirements of Section 346 with an adjusted slump of 7 to 9 inches. Reduced size coarse aggregate may be used as approved by the Engineer. Do not use fly ash, slag, or silica fume for cathodic protection jackets.

Submit the design mix to the Engineer for approval before placing any concrete filler.

457-2.3.3 Special: When required, furnish special fillers in accordance with the Contract Documents. Provide test results and documentation that demonstrate the material meets the requirements for the project. Use materials meeting the requirements of 930-7 when cementitious pre-bagged fillers are specified.

457-2.4 Water: Use water that meets the requirements of Section 923 for all filler mixing. Use potable water for cleaning, rinsing, or any other application that requires direct contact with the piles.

457-2.5 Reinforcing Steel: Use reinforcing steel meeting the requirements of Section 415 for all structural jackets.

457-2.6 Materials Certification and Testing.

457-2.6.1 Certification: For materials other than those for Portland cement grout and Class IV Concrete, provide a certificate to the Engineer certifying that the materials furnished meet all the requirements of this Section and conform in all respects to the materials tested. Attach copies of current test reports to the certificate.

Provide certified test results of the chemical composition of the anode and provide manufacturer certification stating that the dimensions and physical characteristics of the anode meet the requirements of the Contract Documents.

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457-2.6.2 Testing: No test report for tests made more than one year prior to shipment will be accepted for the form material.

Test materials for Portland cement grout and Class IV concrete as required in Section 346 for approved design mixes. Perform sampling and testing using Quality Control technicians meeting the requirements of Section 105.

Test properties of materials for other cement based fillers allowed under 457-2.3.3 same as required for the FDOT approved design mixes. Test the materials at a frequency of one set of tests per load of the mixer. For each set of tests, cast three 4 inch by 8 inch cylinders for compressive strength testing at the required test date. The Engineer may adjust the frequency of testing based on consistency of the mixes. Conduct a field verification mix prior to commencing the jacket installation. Cure samples of cement based materials in accordance with ASTM C-31.

Hardened concrete or grout will be accepted on the basis of strength test results as defined in this Section. Test the laboratory cured samples for compressive strength at 28 days in a laboratory meeting and maintaining at all times the qualification requirements listed in 105-6.

457-3 Construction.

457-3.1 Shop Drawings: Submit shop drawings and obtain approval prior to field installation. Provide shop drawings showing locations of standoff spacers, method of fastening jacket form to piling, method of sealing the form after installation, and method for bracing during placement of filler. Include details of access holes, fiberglass caps, and methods for placing the filler and capping the pumping ports.

457-3.2 Surface Preparation: Remove all cracked or delaminated concrete and excavate to a depth of 3/4 to 1 inch behind the exposed reinforcement. Limit the size of chipping hammers to 20 pounds unless otherwise approved by the Engineer. Thoroughly clean all pile surfaces that the jackets will cover. Remove all oil, grease, dirt, broken concrete, marine growth and any other deleterious material that would prevent proper bonding. Sandblast all exposed reinforcing steel to SSPC-SP10, near white, per the Society of Protective Coatings, to remove all rust and scale before installing the pile jacket. Water blast or mechanically clean reinforcing steel exposed under water by methods and with equipment approved by the Engineer. Clean existing concrete surfaces by sandblasting, wet blasting, wire brushing, water laser, or other methods approved by the Engineer which will yield an equivalent result. Do not place the form until the surface preparation has been approved by the Engineer.

457-3.3 Cathodic Protection: Provide connection to the reinforcement for cathodic protection integral pile jackets inside the jacket limits unless otherwise specified in the Contract Documents. Use connection methods and materials in accordance with the Contract Documents.

457-3.4 Form Placement: Place the fiberglass form in position around the pile; secure and seal the interlocking joint(s), and seal the bottom of the form against the pile surface with the compressible seal and an approved epoxy adhesive meeting the requirements of Section 926. Adjust stand-offs as necessary to prevent misalignment and install temporary hard backing to prevent deformation.

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457-3.5 Filler Placement: Wet to saturation the surface of the pile immediately prior to placing the filler. Place the filler in one continuous pour at no more than 72 hours after surface preparation. Fill the annulus between the pile and pile jacket form following the jacket manufacturer's instructions and the Contract Documents. Do not drop filler material into forms higher than five feet or into forms containing water. Prevent contamination of the filler during placement and provide internal or external vibration to ensure proper consolidation.

Cure filler for a minimum of 96 hours before removing any external bracing. Remove any filler or other extraneous material from the exterior surface of the form and clean the form without damaging the fiberglass or gel coat resin.

457-4 Method of Measurement.

The quantities to be paid for under this Section will be the total feet of Integral Pile Jacket furnished, installed, completed and accepted. Measure length from bottom of the form to top of the form.

457-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. No separate payment will be made for reinforcing steel or filler material. Include payment for anode material and anode connection accessories in the price per foot for Cathodic Protection Integral Pile Jackets.

Payment will be made under:

Item No.	457-1-	Standard Integral Pile Jacket - per foot.
Item No.	457-2-	Cathodic Protection Integral Pile Jacket – per foot